PETROLOGY OF CAMPTONITE FROM CAMPTON, NEW HAMPSHIRE

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The type locality for camptonite as described by Hawes and Rosenbusch in the late 1800's provides samples that have minor variations from camptonites elsewhere in the world. The type dike rock is dark gray, with a holocrystalline panidiomorphic-porphyritic texture, ocellar structures, and phenocrysts of kaersutite and rare augite in a matrix of kaersutite, andesine, augite, and magnetite. Accessories include calcite, apatite, serpentine minerals (replacing olivine?), and zeolites. Other rocks called camptonite may have less amphibole, more zeolites, and variable amounts of biotite or olivine. Chemically, camptonite is like volatile-rich basanite or alkali-olivine basalt, and petrographic differences with volcanic equivalents are ascribed to the hypabyssal environment of camptonite. Modal and chemical variations across the dike are caused by different cooling rates, liquid movement, and mineral-liquid segregation in different portions of the intrusion. Other camptonite dikes in the vicinity have different modes as well, possibly because of flowage segregation of minerals from a common parental magma.

Camptonite, as a derivative of basanitic melts from the mantle, is an excellent candidate for the parental magma of associated alkalic plutons. Chemical diagrams support this model in New England. The type camptonite has a K-Ar age of 194 +/- 8 Ma, and is possibly related to the Early Jurassic Red Hill complex 17 km to the east. Worldwide, camptonite should be recognized as an important magma produced by intraplate rifting or mantle-plume tectonics.